The Center

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The Center is a quarterly newsletter compiled by WRRC to alert potential partners of technology transfer opportunities.

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WRRC Launches New Rice Straw and Wheat Straw Utilization Project

As part of a Bio-Based Products Initiative, WRRC has received funding beginning this Fiscal Year for a new project, tentatively titled, "Novel Bio-based Products Using Fibers from Renewable Agricultural Resources." The objective of the new project will be to convert non-textile agricultural fibers, especially rice and wheat straw, for use in biodegradable packaging materials, fiber-based building materials, and rice paper products. The research will utilize novel fiber refining methods to isolate fibers from crop residue, and apply them to improve the strength and flexibility of bio-based composites. It may also deal with agricultural fibers from other sources such as chicken feather fibers, sugar beet pulp and underutilized bast fiber.

Rice straw is produced as a biproduct of rice cultivation. Fields must be cleaned of straw to make way for the next crop. Photo © courtesy California Rice Association.

As part of the new project, a WRRC research team including Bill Orts, research chemist, Greg Glenn, plant physiologist, and a new chemical engineer or chemist, will develop fiber-reinforced packaging materials using a foam-baking process, extrusion, injection molding, and/or thermoforming that will exploit the advantages of specific agricultural fiber sources. The team will also develop novel isolation procedures for the fibers. Once fibers are obtained they will be tailored for special uses. A novel aspect of the new project will focus on using nanotechnology to make composites. To date, virtually all of the developments in nanotechnology have relied on synthetic polymers or clay, although natural polymers may offer advantages for some uses or characteristics.

If this research is successful, the results of the project could be used commercially to make food containers, such as cups and sandwich clamshells, and in food packaging films, which would be biodegradable alternatives to petroleum-based packaging. In the longer-term, fibers from these agricultural resources could be developed for use in fiber-reinforced nanocomposites for high tech industries. After preliminary results have been obtained, WRRC will be seeking CRADA partners to help develop commercial products based on this research.

For more information contact: Bill Orts, 510.559.5730, orts@pw.usda.gov

WRRC Patent Activity
August -- December 2000

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U.S. Patent Applications Filed:

August 28, 2000
Serial No. 09/649,747
"Nucleic Acid Sequences Encoding Cell Wall-Degrading Enzymes and Use to Engineer Resistance to Fusarium and Other Pathogens"
Inventors: P. Okubara, A. Blechl, T. Hohn, R. Berka

November 16, 2000
Serial No. 09/715,677
"Transformation of Ricinus Communis, The Castor Plant"
Inventors: T. Mckeon, G. Chen

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How Do Businesses Get Access to These Technologies

WRRC is seeking private companies interested in licensing technologies which have been patented or for which a patent application has been filed. We are also looking for companies interested in becoming our partners in Cooperative Research and Development Agreements (CRADAs). CRADA partners have the first right to negotiate an exclusive license for each invention which is made as part of the CRADA. We encourage small and minority-owned business to take part in our technology transfer programs.

WRRC Symposium and Exposition

As you can see from the photos below, the September 8, 2000 WRRC symposium and exposition was a success and brought many friends of the Center together to hear talks on trends in agricultural science and overviews of WRRC research. Following the symposium, participants viewed posters and took guided tours of WRRC featuring the following: processing restructured fruit and vegetables, flavored rice cakes and degradable packaging foams from starch, using the flight tunnel to observe moth behavior, biological control of invasive weeds, a genomic approach to wheat quality engineering and the scanning electron microscope.

We hope many of you who weren't able to attend the event will make a point to visit the Center during 2001. To arrange a visit, please contact, Jim Seiber, phone: 510.59-5600 or email: jseiber@pw.usda.gov.